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MILS: The Mineral Industry Location System of the Federal Bureau of Mines

By Andrew W. Berg and Fred V. Carrillo



UNITED STATES DEPARTMENT OF THE INTERIOR

Information Circular 8815

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UNITED STATES DEPARTMENT OF THE INTERIOR

Cecil D. Andrus, Secretary

BUREAU OF MINES

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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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CONTENTS

	<u>Page</u>
Abstract.....	1
Introduction.....	1
Input.....	2
Sources of data.....	2
Categories of information.....	2
Identification.....	4
Location.....	4
Universal Transverse Mercator (UTM).....	4
Topographic.....	4
Basin.....	4
Holdings.....	4
Reference.....	4
Commodity.....	4
Public land survey (PLS).....	4
Names.....	5
Bibliography.....	5
Owners.....	5
Precision.....	5
Updating procedures.....	5
Output available.....	5
Open file at the Western Field Operations Center.....	5
1:250,000-scale topographic quadrangles.....	5
1:500,000-scale State overlays.....	7
Commodity overlays.....	7
Cluster point locations.....	7
Density plot overlays.....	8
Indexes.....	8
Reproduction of open file data.....	8
Special requests.....	8
Magnetic tape.....	8
Special areas or data.....	9
Special request listings.....	9
Field operations centers.....	11
Appendix A.--Computer entry forms.....	12
Appendix B.--Computer cluster overlays and printouts.....	14
Appendix C.--Density plot overlays.....	21
Appendix D.--Indexes.....	23

ILLUSTRATIONS

1. Field Operations Center jurisdiction areas.....	3
2. Index for 1:250,000-scale quadrangle maps covering six Western States.....	6
3. Examples of some output options for MILS.....	10
A-1. MILS entry form 1.....	12
A-2. MILS entry form 2.....	13
B-1. Clustered MILS locations for the Wallace 1:250,000 quadrangle.....	14
B-2. Wallace 1:250,000-scale quadrangle.....	15

bd24 9 July 84

ILLUSTRATIONS--Continued

	<u>Page</u>
B-3. MILS printout page for Wallace 1:250,000-scale quadrangle.....	16
B-4. Clustered MILS locations for Idaho reduced from 1:500,000 scale...	17
B-5. MILS printout page for Idaho.....	18
B-6. Clustered MILS lead and zinc locations reduced from 1:1,750,000 scale.....	19
B-7. Printout page of lead and zinc occurrences in six Western States..	20
C-1. Density plot of MILS locations reduced from 1:7,500,000 scale.....	21
C-2. Density plot of gold occurrences reduced from 1:1,750,000 scale...	22
D-1. Page of State alphabetic index of Idaho MILS locations.....	23
D-2. Page of county alphabetic index for Shoshone County MILS locations	24

MILS: THE MINERAL INDUSTRY LOCATION SYSTEM OF THE FEDERAL BUREAU OF MINES

by

Andrew W. Berg¹ and Fred V. Carrillo²

ABSTRACT

The Bureau of Mines Mineral Industry Location System (MILS) is part of the computerized Minerals Availability System (MAS), a comprehensive data base of known mineral deposits. MILS, the location subsystem of MAS, has become widely used by the minerals industry and organizations with land-use planning and land management responsibilities.

Information on more than 135,000 mineral locations and processing plants in the United States is contained in the data base. This information includes the name, location, mineral commodity, type of operation, bibliography, and cross-references for each property or prospect.

Computer-drawn map overlays at various scales showing clustered MILS locations and computer printouts keyed to those overlays are available for inspection and reproduction at the Bureau's Field Operations Centers at Juneau, Alaska, Denver, Colo., Pittsburgh, Pa., and Spokane, Wash.

INTRODUCTION

The Mineral Industry Location System (MILS) is the location subsystem of the Federal Bureau of Mines Minerals Availability System (MAS). The objective of the MAS program is systematic measurement and classification of domestic and foreign mineral deposits according to their respective extraction technologies, economics, and commercial availability. MAS deals with complete mineral deposit evaluations and provides a rapid and systematic procedure to monitor the present and potential availability of mineral supplies to the United States.

Within MAS, the Mineral Industry Location System (MILS) locates and provides related information on mineral industry sites throughout the world. A "mineral industry location" is defined as metallic or nonmetallic occurrences, prospects, mines (both past and present producers), geothermal wells, and mineral processing plants such as mills, smelters, and refineries.

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Responsibility for development of MAS-MILS data for California, Idaho, Montana, Nevada, Oregon, Washington, and Hawaii, as well as offshore sites and deep-seabed deposits, resides with the Bureau's Western Field Operations Center (WFOC) at Spokane. Responsibility for the remaining States west of the Mississippi River resides with the Intermountain Field Operations Center (IFOC) at Denver. Responsibility for all States east of the Mississippi River resides with the Eastern Field Operations Center (EFOC) at Pittsburgh. Alaskan locations are the responsibility of the Alaska Field Operations Center (AFOC) at Juneau (fig. 1).

Because of differing startup dates, Field Operations Centers are at different levels of development regarding MAS-MILS input from their areas. To date, the MILS data base in Denver contains more than 4,500 locations for the AFOC area, 30,000 locations for the IFOC area, 39,000 locations for the EFOC area, and 58,000 locations for the WFOC area. Examples discussed in the following pages are from the WFOC area.

For Bureau use and open file availability, a comprehensive library of MILS data is maintained at WFOC for California, Idaho, Montana, Nevada, Oregon, Washington, and Hawaii. Map overlays of MILS locations and their related computer printouts provide a rapid means of identifying mineral properties in various geographic areas. These often provide a convenient starting point for a wide variety of mineral-related projects.

Principal users of MILS data include mining or minerals exploration companies as well as public and private organizations with land-use planning and land management responsibilities.

INPUT

Sources of Data

MILS data, for entry into the system, are derived from a variety of sources. Publications of the Bureau of Mines (USBM), the U.S. Geological Survey (USGS), and State geology departments are reviewed for mineral locations and related data. Unpublished data from the USBM and location information from mining companies comprise important additional sources of information. Various periodicals dealing with the mining industry, along with inspection reports of the Mine Safety and Health Administration (MSHA) on currently operating properties, are a constant source of current information to be incorporated into the MILS system.

Categories of Information

Each MILS property is assigned a numeric code which indicates the State, county, and a numeric sequence number within that county. For example, the Coeur Project property in Idaho is identified by the number 016-079-0040. This indicates the State of Idaho (016), county of Shoshone (079), and numeric sequence number (0040) in that county.

The information collected for each MILS property, when complete, consists of 12 categories or groups, as described in the following paragraphs.

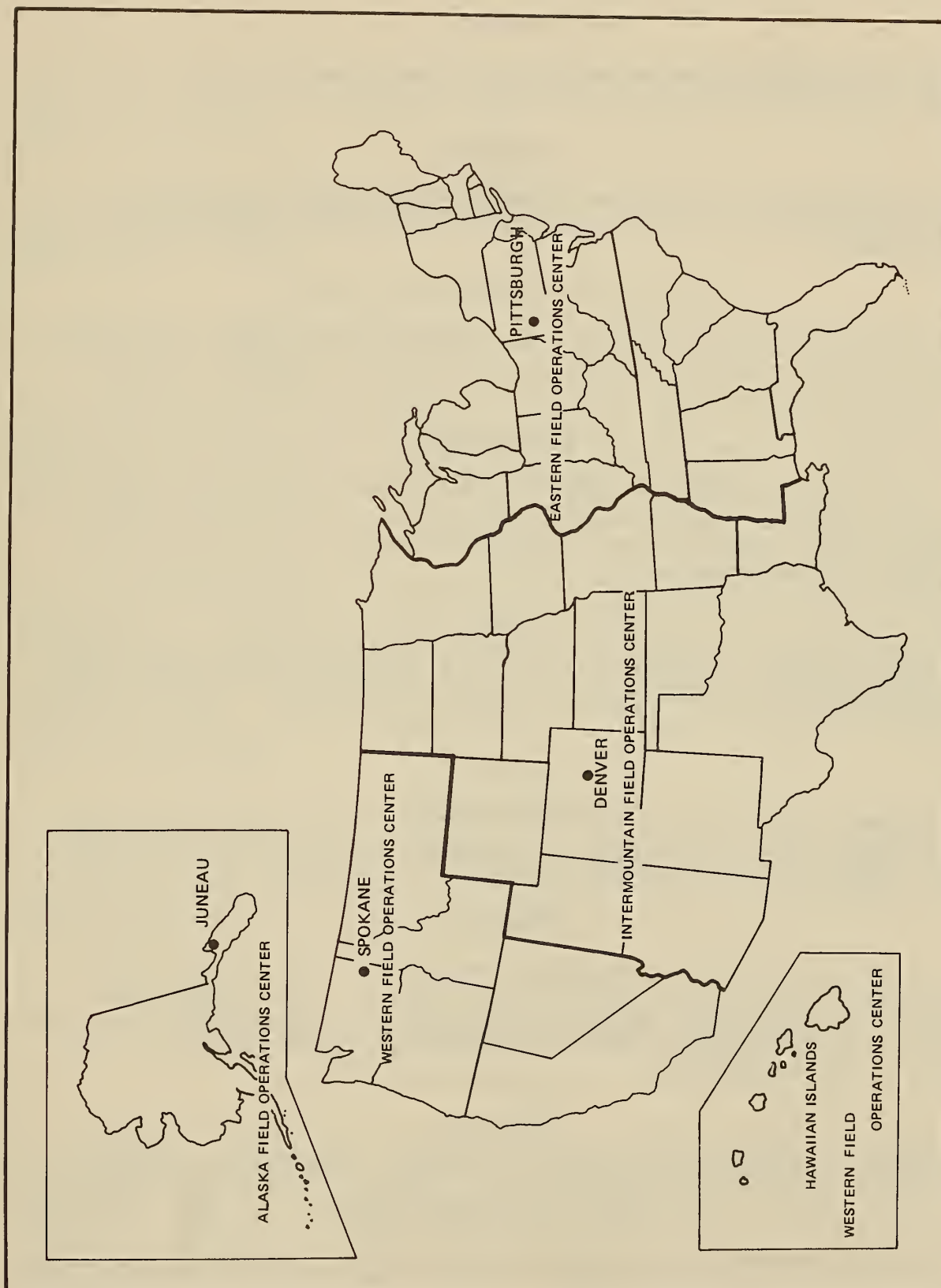


FIGURE 1. - Field Operations Center jurisdiction areas.

Identification

The identification group contains the primary property name, type of operation, and current operational status.

Location

Data entered in the location category include latitude, longitude, point of reference, elevation, and the year in which the property was last field-checked.

Universal Transverse Mercator (UTM)

Universal Transverse Mercator (UTM) coordinates are produced automatically by computer from the latitude-longitude entry, along with zone and hemisphere.

Topographic

The topographic group includes the name of the 1:250,000-scale quadrangle map that includes the MILS location. Name and scale of the largest scale USGS topographic quadrangle map on which the location was plotted for entry into MILS are also entered.

Basin

Under the basin category, the name of the drainage basin in which the mineral property is located and its corresponding USGS River Basin Code are entered.

Holdings

Holdings indicate the type of ownership or control of the mineral deposit or processing plant. Examples are fee ownership, private lease, or located claim. Three types can be entered in order of importance.

Reference

The MILS subsystem is cross-referenced to MSHA identification numbers, USBM mineral property files, USBM mine map repository, USGS Computerized Resources Information Bank (CRIB) system, and the soon-to-be-implemented USBM drill core library at Reno. The cross-references provide access to a wide variety of additional data.

Commodity

Mineral commodities are identified in order of decreasing importance.

Public Land Survey (PLS)

The PLS group provides for entry of the meridian, township, range, section, and section subdivision.

Names

Often a mineral property has had more than one official name. If several names are encountered in studying a property's literature, the "names" group permits their entry.

Bibliography

The bibliography group allows a user of MILS data to consult sources for additional information. The system can accommodate as many as 999 lines of bibliographic citations.

Owners

The name of the owner or operator and the home office location are entered in this group.

Completed computer input forms for the Coeur Project example are illustrated in appendix A. The completed forms can be mailed to the Minerals Availability Field Office in Denver for entry into the system or entered at the Field Operations Centers on remote computer terminals.

Precision

The system provides for an entry reflecting the degree of accuracy by which the location selected by the evaluator represents the actual location of the property. Location information from published sources is sometimes vague. Alternatives to entering such vague locations are either to leave properties out of the system or to apply a low degree of precision. The latter course is usually followed. When better location information becomes available from additional sources or field investigations, the entry is changed to a higher degree of precision.

Updating Procedures

Additions and corrections to the data base are made as new or additional information becomes available. This permits the data base to reflect, on a current basis, the latest and best information. Entry by remote terminal at Field Operations Centers permits daily updating.

OUTPUT AVAILABLE

Open File at the Western Field Operations Center

1:250,000-Scale Topographic Quadrangles

Standard base maps used for clear plastic overlays in MILS are USGS 1:250,000-scale quadrangles. The conterminous United States are covered by 473 of these quadrangles. The WFOC area is covered by 107 1:250,000-scale quadrangles (fig. 2). Computer-generated MILS data supply cluster point locations,³ which are plotted on the overlays. The computer printout keyed

³See definition of cluster point locations, page 7.

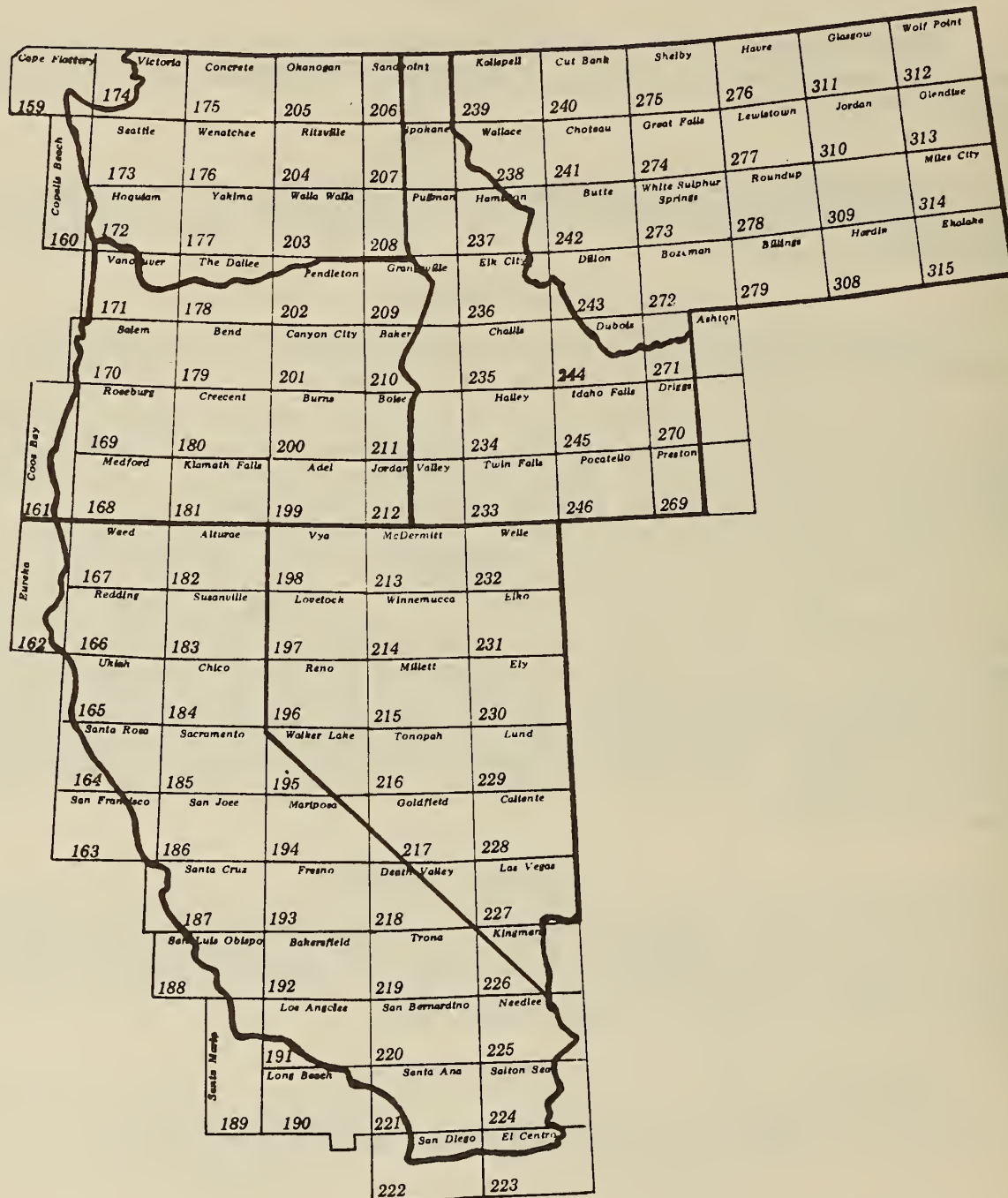


FIGURE 2. - Index for 1:250,000-scale quadrangle maps covering six Western States.

to these cluster numbers contains the corresponding data for each property represented on the overlay. Appendix B (fig. B-2) shows a reduced reproduction of the 1:250,000-scale map for the Wallace, Idaho, quadrangle. Figure B-1 shows the location symbols that appear on the corresponding computer-drawn MILS overlay. Appendix B also includes a typical page from the corresponding computer printout for the Wallace quadrangle (fig. B-3). The 1:250,000-scale overlays and their corresponding printouts are the most frequently requested MILS product.

1:500,000-Scale State Overlays

State MILS overlays at a scale of 1:500,000 are available. These overlays can be used with USGS State geologic maps as well as land status or other map types. An example of a State overlay is shown in figure B-4. Figure B-5 is a reproduction of a printout page keyed to that overlay. Such overlay and printout sets may be useful to organizations with land-use planning, exploration, or jurisdictional responsibilities on a statewide basis.

Commodity Overlays

Another useful overlay is one displaying clustered locations for a specific commodity or commodities in MILS. For this purpose a WFOC area base map has been prepared at a scale of 1:1,750,000. Figure B-6 illustrates an overlay and base map for lead and zinc. Figure B-7 is a computer printout page keyed to that overlay. Overlays and printouts for most major metal commodities are available at this scale from the WFOC open file library.

Cluster Point Locations

Plotting all individual sites on plastic overlays at most map scales could result in excessive cluttering of points. To avoid this problem, cluster points are used. A cluster point represents all MILS locations lying within 1/4 inch (0.63 cm) of the point on the overlay (fig. B-1). Circle radii distances on the ground represented by the 1/4-inch (0.63-cm) cluster radius at various map scales follow:

<u>Scale</u>	<u>Cluster radius</u>	<u>Ground distance</u>
1:24,000	1/4 inch (0.63 cm)	0.10 mile (0.16 km)
1:62,500	1/4 inch (.63 cm)	.25 mile (.40 km)
1:250,000	1/4 inch (.63 cm)	1.00 mile (1.61 km)
1:500,000	1/4 inch (.63 cm)	2.00 miles (3.22 km)
1:1,750,000	1/4 inch (.63 cm)	7.00 miles (11.26 km)
1:2,500,000	1/4 inch (.63 cm)	10.00 miles (16.10 km)
1:3,168,000	1/4 inch (.63 cm)	12.00 miles (19.31 km)

As the map scale becomes larger, the location density per cluster point can decrease to a minimum of one site. Even at the small scale of 1:1,750,000, with a cluster radius distance on the ground of 7 miles (11.26 km), a cluster point may represent only one site within certain areas or for certain commodities.

Density Plot Overlays

An additional method of displaying MILS data on an overlay is the density plot. By this method each MILS location is represented by a single computer-generated point on the overlay corresponding to its location coordinates. This point generation can be programed for all locations (fig. C-1), or for any selected data category within the system.

A density plot for gold at a scale of 1:1,750,000 is illustrated by a reduced reproduction (fig. C-2). Future uses for density plots could include areal geochemical studies and the definition of metallogenic provinces. Density plots are available on an open file basis for gold, lead, silver, and zinc, and for all MILS locations in the WFOC area.

Indexes

Indexes have been prepared to provide efficient access to the voluminous MILS data on open file. Two frequently used indexes are the State Alphabetic (fig. D-1) and the State/County Alphabetic (fig. D-2).

If a property name and county are known, reference to the appropriate alphabetic indexes will quickly tell the investigator if the property is in the MILS system. If the property name is known, but not the county, then the State alphabetic listing will quickly determine if the property is in the system. These listings also provide secondary names, location, 1:250,000-scale quadrangle name, 7.5- or 15-minute map name, and sequence number.

Reproduction of Open File Data

On receipt of a request for MILS open file data, the open file originals from the Field Operations Center library are taken to a local reproduction firm. Payment for reproduction is arranged between the requestor and the firm selected. In 1979 charges for these services varied somewhat between Field Operations Centers but were about \$0.90 per square foot for plastic overlays and \$0.09 per page for copies of the computer printout.

Special Requests

Magnetic Tape

A magnetic computer tape containing MILS data for the entire United States is available to organizations that wish to use it with their own computer facilities. This tape can be ordered at cost (\$80.00 in late 1979) from the Office of Minerals Availability, Bureau of Mines, 2401 E. Street NW, Washington, DC 20241. Payment should be made by check or money order to the Bureau of Mines. Additional information regarding the MILS computer tape may be obtained by calling 202-634-1292.

Special Areas or Data

The variety of uses for MILS data has created a demand for overlay configurations that differ from those currently maintained on open file at the Field Operations Centers. A Bureau of Land Management area, National Forest, or State land area might be required. Additionally, a need for a different set of information using overlays over standard map scales could develop for a specific problem. These kinds of output can be obtained on a special-request basis through the appropriate Field Operations Center.

Special requests require consideration of some of the output options that exist for MILS (fig. 3). For example, a special request for "producers" should specify whether "current producers" as well as "past producers" are required. In the "type of operation" category, a special request for all mines must include, at least, all surface, surface-underground, and underground mines to be reasonably inclusive.

Special requests are potentially costly, as programing and computer time on a custom basis are involved; therefore, quotations are obtained for the requestor before the work is undertaken.

Special Request Listings

Another type of special request is a list with limited specific data. The user might, for example, desire an alphabetic list of locations by township and range, a list with only the property name and commodity, or a wide variety of combinations limited only by the contents of the data base.

Domain (14 characters) describes the type of public or private domain of the deposit area:

Entry
UNKNOWN
MIXED
PRIVATE
MUNICIPALITY
COUNTY
STATE
STATE FOREST
STATE PARK
STATE OFFSHORE
FEDERAL
NAT FOREST
NAT RECREATION
NAT WILDERNESS
NAT PRIMITIVE
NAT PARK
NAT MONUMENT
NAT OFFSHORE
PLM ADMIN
MILITARY RES

POR Point of Reference and precision is a two-part field. The first part (8 characters) indicates the physical reference point and the second part (6 characters) states the precision:

Precision
entry
TOL
100M
500M
1KM
5KM
10KM
100M

Reference
entry
MATH ENT
TRENCH
ONE BODY
CLAIM
APPROX (0 precision)
PLANT
TOWN

3661
1293 NAME - COEUR PROJECT
STATE - IDAHO
LATITUDE - 47 29 25 N
LONGITUDE - 115 59 33 W
UTM: ZONE 11 NORTHING 5259920 EASTING 575890
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
RIVER BASIN - 760 COEUR D'ALENE RIVER
STATUS - PRODUCER
MESA ID NO.
MAP NAME - WALLACE
1:250,000 MAP NAME - WALLACE
PRIMARY NAME - 1293 COEUR PROJECT
OTHER NAMES -
COMMODITIES - SILVER
ZINC
FRYKLIHD V C 1964 USGS PRO PPR 445 P 70

REFERENCE NAME - SHOSHONE
COUNTY - SHOSHONE
PRECISION - 100 METERS
REFERENCE POINT - MAIN ENT.
5259920 EASTING 575890
TOWNSHIP - 048 N RANGE - 004 E
COEUR D'ALENE RIVER
OPERATION TYPE - UNDERGROUND
YEAR FIELD CHECKED -
TYPE - 15 MIN/USGS TOPO
238 MINERAL PROPERTY FILE - 37.176
LEAD
COPPER
GOLD
ZINC

Current status (13 characters) must be selected from the following table:

Entry
UNKNOWN
PRODUCER
PAST PRODUCER
OILYEL DEPOSIT
EXP PROSPECT
EXP PROSPECT
OTHER

Description
Unknown or undetermined
Producer
Past producer
Developed deposit
Explore prospect
Raw prospect
Other

Type of Operation (17 characters) must be selected from the following table, and refers to the type of operation presently existing at this site.

Entry
UNKNOWN
SURFACE
UNDERGROUND
SURF-UNDERG
UNDERWATER
WELL
PROD PLANT
PROSPECT
MINERAL LOC
PLACER

Description
Unknown or undetermined
Surface operation
Underground operation
Surface-underground operation
Underwater operation
Well operation
Processing plant
Prospect
Mineral location (claim)
Placer operation

FIGURE 3. - Examples of some output options for MILS.

FIELD OPERATIONS CENTERS

A request for information about the MILS system or the implementation of a MILS request should be directed to the appropriate Field Operations Center. Addresses of the four centers follow.

Alaska Field Operations Center
Bureau of Mines
P.O. Box 550
Juneau, Alaska 99802

Intermountain Field Operations Center
Bureau of Mines
Building 20, Denver Federal Center
Denver, Colo. 80225

Eastern Field Operations Center
Bureau of Mines
4800 Forbes Avenue
Pittsburgh, Pa. 15213

Western Field Operations Center
Bureau of Mines
E. 315 Montgomery
Spokane, Wash. 99207

APPENDIX A.--COMPUTER ENTRY FORMS

MINERALS AVAILABILITY SYSTEM (MILS ENTRY FORM)

DATE: 11/19/94 PAGE 1 OF 2
EVALUATOR: Swaney

SEQUENCE NUMBER STA/NAT COU/PS ID NUMBER 01160790040										NAME (primary) 5556 5768 80										TYPE of operation 5556 5768 80										CURRENT status 5556 5768 80									
IDENTIFIER II IDENT 01160790040										COUNTRY PROJECT 5556 5768 80										UNDERGROUND 5556 5768 80										PRODUCTION 5556 5768 80									
LOCALITY 01160790040										21 LATITUDE 2726 LONGITUDE 3536 N4729125W11155933M ENT: 100M 9151M: 1100MSEA LEVEL										DATE 68 69 YFC 72										Year Field Checked									
UTM 01160790040										QUADRANGLE (1:250,000) 3839 WALLACE										MAP name 56 5768 80										DOMAIN 56 5768 80									
TOPOG 01160790040										RIVER basin 4445RBC4949 HUC 56										MINERAL HOLDINGS 49 5										PRIVILEGE 56 5768 80									
BASIN 01160790040										FREE OWNERSHIP 35 56 5768 80										EVA color 3536 MPF 39 MID 4546 JSC 52 E54Y0157										WFOG-MILS W 1000479 M 11977									
REFER 01160790040										COMMUNITY 3435 WDC (Modifier Of Community)										COMMUNITY 3435 WDC (Modifier Of Community)										COMMUNITY 3435 WDC (Modifier Of Community)									
PLS 01160790040										P-MERIDIAN 3435P-TWN 3940P-RNG 44P-SEC 47 P-SUB 5253 P-SURVEY 58										BOISE MERIDIAN 448 W 004 E 19 E 2 SURVEY										SURVEY									

FIGURE A-1. - MILS entry form 1.

APPENDIX B.--COMPUTER CLUSTER OVERLAYS AND PRINTOUTS

Editor's Note.--In the following figure B-1, a single symbol represents all sites at a particular location.

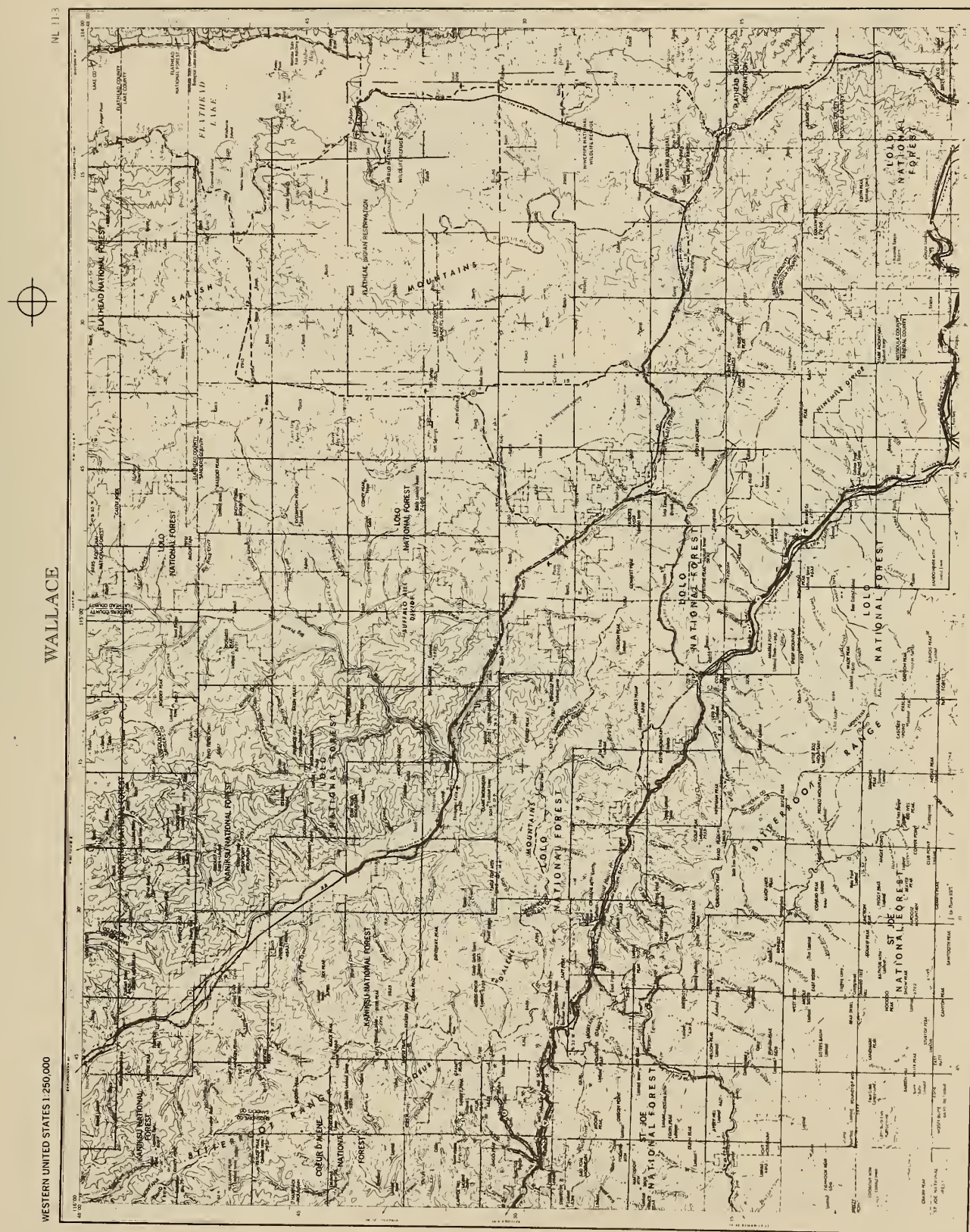


FIGURE B-2. - Wallace 1:250,000-scale quadrangle.

167 259
 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 29 25 N PRECISION - 100 METERS
 LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259920 EASTING 575890
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PROOUER OPERATION TYPE - UNDERGROUND
 MESA ID NO. 10 00479 YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
 PRIMARY NAME - 167 COEUR PROJECT
 COMMODITIES - SILVER COPPER LEAD
 ZINC GOLD
 FRYKLUND V C 1964 USGS PRO PPR 445 P 70
 MILL CAPACITY 450 TPD PRODUCING 100,000 to 500,000 TONS ANNUALLY

260
 167 NAME - RAINBOW MINE REFERENCE NUMBER - 0160790361
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0899 METERS
 LATITUDE - 47 29 26 N PRECISION - 100 METERS
 LONGITUDE - 115 59 15 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259865 EASTING 576271
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 SE 1/4 SE 1/4 NE 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 167 RAINBOW MINE
 COMMODITIES - LEAD ZINC SILVER
 HOBBS ET AL 1965 USGS PROF PAPER 478.

261
 168 NAME - CUNNINGHAM MINE REFERENCE NUMBER - 0160790304
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1736 METERS
 LATITUDE - 47 30 13 N PRECISION - 100 METERS
 LONGITUDE - 115 49 40 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5261578 EASTING 588280
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 005 E
 DESCRIPTION SECTION - 16 SW 1/4 SE 1/4 NW 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - RAW PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - BURKE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 168 CUNNINGHAM MINE
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

FIGURE B-3. - MILS printout page for Wallace 1:250,000-scale quadrangle.



FIGURE B-4. - Clustered MILS locations for Idaho reduced from 1:500,000 scale.

3660
1293 NAME - CALADAY REFERENCE NUMBER - 0160790245
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1097 METERS
LATITUDE - 47 27 44 N PRECISION - 500 METERS
LONGITUDE - 115 56 26 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5256860 EASTING 579850
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION - 16 NONE
RIVER BASIN - 76AA LOCHSA RIVER 7627 DOMAIN - PRIVATE
STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED -
MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
PRIMARY NAME - 1293 CALADAY
COMMODITIES - UNDETERMINED
3 MI SE OF OSBURN
USBM LIAISON OFF REPT MNG OP 1972

3661
1293 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
LATITUDE - 47 29 25 N PRECISION - 100 METERS
LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5259920 EASTING 575890
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION - 19 E 1/2
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED -
MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
PRIMARY NAME - 1293 COEUR PROJECT
OTHER NAMES -
COMMODITIES - SILVER COPPER LEAD
ZINC GOLD
FRYLUND V C 1964 USGS PRO PPR 445 P 70

3662
1293 NAME - GALENA MINE REFERENCE NUMBER - 0160790010
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
LATITUDE - 47 28 40 N PRECISION - 100 METERS
LONGITUDE - 115 57 58 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5258560 EASTING 577900
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION - 29 E 1/2
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
MEAS ID NO. YEAR FIELD CHECKED -
MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 64.013
PRIMARY NAME - 1293 GALENA MINE
COMMODITIES - LEAD ZINC COPPER
ANTIMONY SILVER
MINE-TONNES/YR - ORE =254016 LEACH = WASTE= 1975
PLANT - TYPE=FLOTATION TONNES/YR- INPUT=254016 OUTPUT= 1975
FRYLUND V C 1964 USGS PP 445 (GOOD)
IDA BUM & GEOL BULL 16 (GOOD)

FIGURE B-5. - MILS printout page for Idaho.

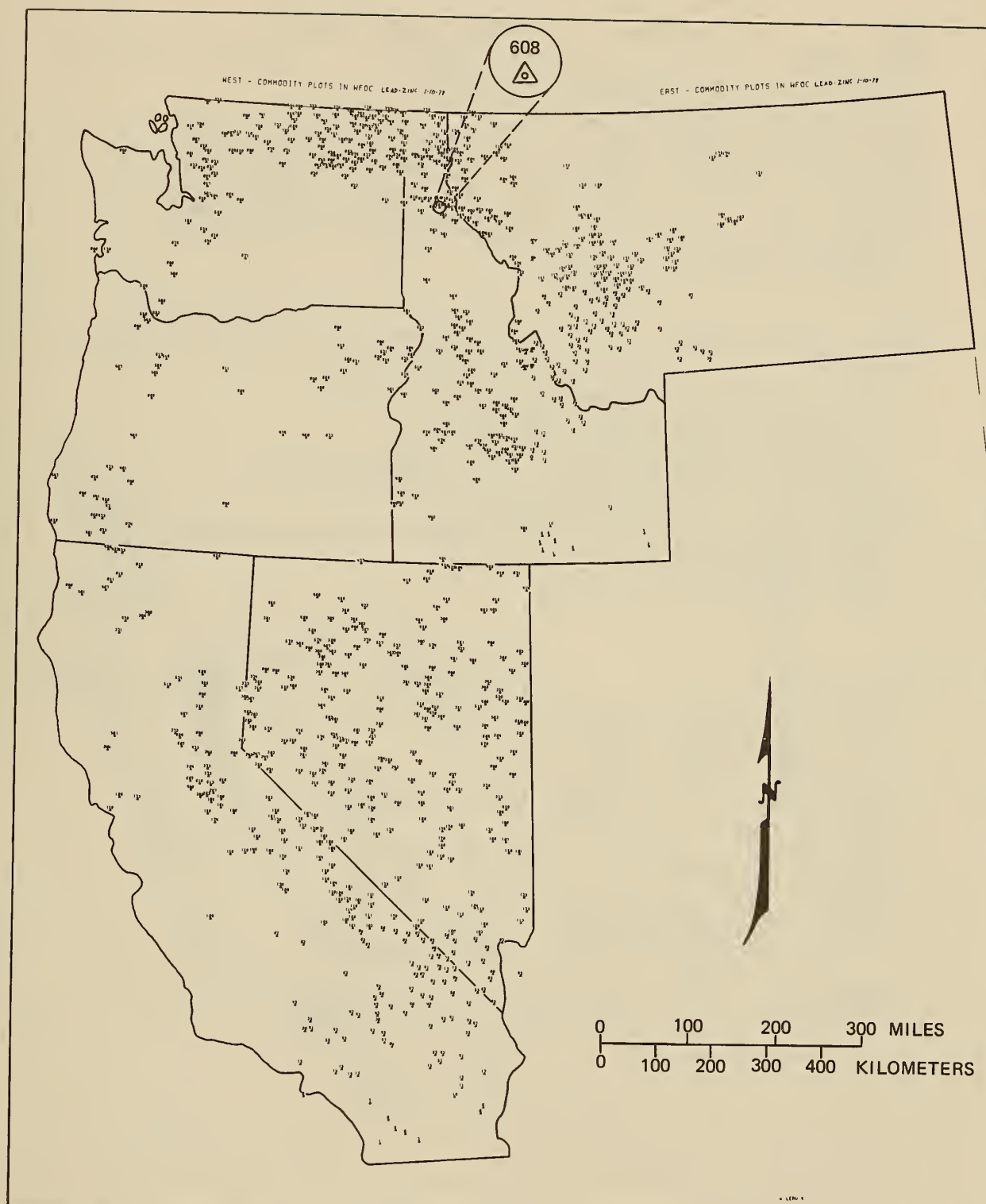


FIGURE B-6. - Clustered MILS lead and zinc locations reduced from 1:1,750,000 scale.

2239
 608 NAME - CAPITOL SILVER LEAD MINE NO. 2 REFERENCE NUMBER - 0160790293
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1496 METERS
 LATITUDE - 47 33 25 N PRECISION - 100 METERS
 LONGITUDE - 115 58 20 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5267351 EASTING 577323
 PUBLIC LAND SURVEY TOWNSHIP - 049 N RANGE - 004 E
 DESCRIPTION SECTION - 32 NE 1/4 NW 1/4 NE 1/4
 RIVER BASIN - U UNIDENTIFIED CODE DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - BURKE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 608 CAPITAL SILVER LEAD MINE NO. 2
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

2240
 608 NAME - COEUR D ALENE MINE REFERENCE NUMBER - 0160790295
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0871 METERS
 LATITUDE - 47 29 53 N PRECISION - 100 METERS
 LONGITUDE - 116 00 45 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5260767 EASTING 574376
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 003 E
 DESCRIPTION SECTION - 24 NE 1/4 NE 1/4 SW 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - CALDER TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - SPOKANE 207 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 608 COEUR D ALENE MINE
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

2241
 608 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 29 25 N PRECISION - 100 METERS
 LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259920 EASTING 575890
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION 19 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
 MESA ID NO. 10 00479 YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
 PRIMARY NAME - 608 COEUR PROJECT
 COMMODITIES - SILVER COPPER LEAD
 ZINC GOLD
 FRYKLUND V C 1964 USGS PRO PPR 445 P 70
 MILL CAPACITY 450 TPD PRODUCING 100,000 to 500,000 TONS ANNUALY

FIGURE B-7. - Printout page of lead and zinc occurrences in six Western States.

APPENDIX C.--DENSITY PLOT OVERLAYS

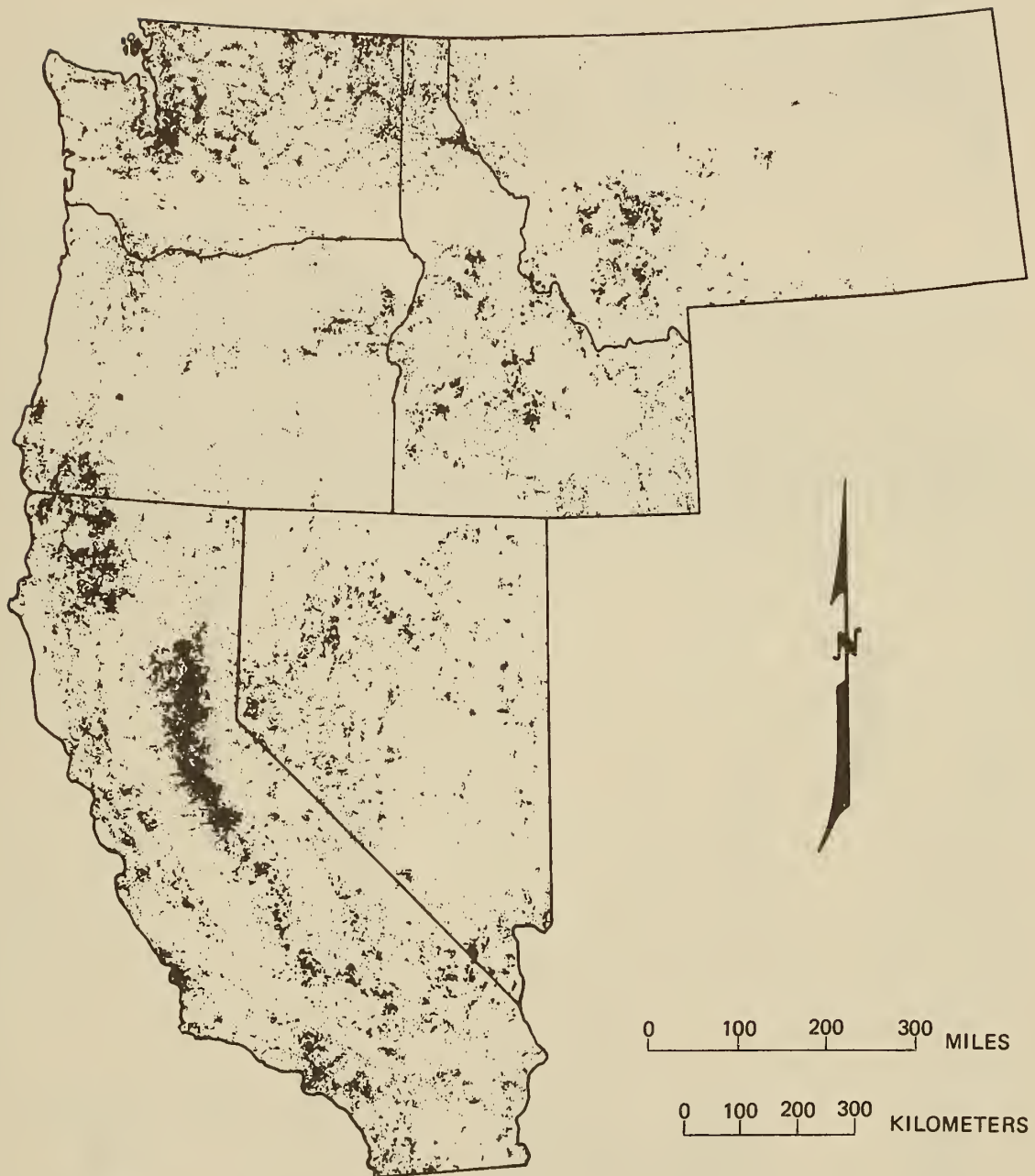


FIGURE C-1. - Density plot of MILS locations reduced from 1:7,500,000 scale.



FIGURE C-2. - Density plot of gold occurrences reduced from 1:1,750,000 scale.

ALPHABETIC INDEX FOR THE STATE OF IDAHO

PAGE 19

PROPERTY NAME	PRIMARY NAME	SEC LOCATION	QUAD NAME	SEQUENCE #
CLEARWATER		23 T042N R010E	CHAMBERLAIN MTN	7 1603500005
CLEARWATER AND WOLVERINE		33 T003N R019E	HAILEY	1601300074
CLEARWATER COPPER MINE		16 T042N R019E	MALLARD PEAK	7 1607900186
CLEARWATER GULCH		06 T036N R006E	PIERCE	7 1603500038
CLEARWATER MINE		23 T042N R010E	CHAMBERLAIN MTN	7 1607900091
CLEARWATER MINE		34 T029N R006E	GOLDEN	7 1604900413
CLEVELAND		17 T028N R008E	ELK CITY	7 1604900090
CLEVELAND		16 T020N R009E	EDWARDSBURG	7 1608500095
CLEVELAND MINE		31 T012S R041E	ONEIDA NARROWS RE	7 1604100003
CLIFF		06 T006N R006E	PIONEERVILLE	7 1601500042
CLIFFTON BELL		14 T022N R003W	CUPRUM	15 1600300020
CLIMAX		07 T004N R010E	ROCKY BAR	7 1603900017
CLIMAX		20 T002N R018E	BELLEVUE	15 1601300030
S CLIMAX	GOLDSTONE MINE	16 T016N R044W	STURGILL PEAK	15 1607000019
CLIMAX GROUP		14 T021N R024E	GOLDSTONE MTN	15 1605900187
S CLIMAX MINE		11 T012N R029E	SCOTT PEAK	15 1605900331
CLIPPER	SILVER CROWN MINE	18 T003N R015E	SAWTOOTH	30 1602500053
CLIPPER BULLION MINE		14 T012N R029E	SCOTT PEAK	15 1605900333
CLOVERLEAF MINE		31 T024N R019E	SHOUP	15 1605900284
CLOUFF TUNNELS		06 T006N R006E	PIONEERVILLE	7 1601500047
COAL		32 T005N R044E	GARNS MTN	15 1608100006
COAL CLOWARD MINE		15 T007S R033E	MICHAUD	15 1607700027
COAL CREEK		06 T001N R040E	AMMON, ID	15 1601900073
COAL- FALL CK BASIN MINE		16 T011N R014E	EAST BASIN CREEK	7 1603700382
COAL-BRINSON MINE, CANYON COAL MNG		03 T001S R042E	HELL CREEK ID	7 1601900071
COAL-CROLEY MINE		35 T002N R040E	HELL CREEK, ID	7 1601900072
COAL-GOD SEND TO HEALTH MINE		35 T001S R041E	HELL CREEK, ID	15 1601900070
COBALT MINE		04 T001S R042E	HELL CREEK, ID	15 1601900074
COEUR D ALENE AND PINE CK ANTIMONY		35 T021N R018E	BLACKBIRD MTN	15 1605900075
COEUR D ALENE BIG CREEK		06 T048N R002E	KELLOGG	15 1607900018
COEUR D ALENE CHAMPION		16 T048N R003E	KELLOGG	15 1607900076
COEUR D ALENE MINE		12 T048N R005E	BURKE	15 1607900296
COEUR D ALENE MINING CO.		24 T048N R003E	CALDER	15 1607900295
COEUR D ALENE MOUNTAIN		05 T028N R007E	CENTER STAR MTN	7 1604900519
COEUR D ALENE NORTH FORK		18 T049N R006E	COOPER GULCH	15 1607900137
COEUR D ALENE PREMIER		12 T049N R003W	LANE	15 1605500027
COEUR DALENE INVESTORS INC		23 T049N R005E	BURKE	15 1607900130
COEUR PROLECT		08 T047N R002E	CALDER	15 1607900243
COGILL MINE		05 T005S R003E	SILVER CREEK	15 1607300246
COIN BOND GROUP		19 T048N R004E	WALLACE	15 1607900040
COLE ROAD PIT		35 T049N R003E	KELLOGG	15 1607900297
COLGATE LICKS		10 T007N R004E	PLACERVILLE	7 1601500015
COLLISTER		08 T 3N R 2E	BOISE	15 1600100129
COLONEL		15 T036N R012E	BEAR MOUNTAIN	7 1604900542
S COLONEL	COLONEL SELLERS	23 T014N R011E	GREYHOUND RIDGE	15 1603700246
COLONIAL CONCRETE PLANT		16 T026N R006E	ELK CITY	15 1604900292
COLONIAL CONCRETE SNAKE RIVER DREGG		13 T029N R008E	ELK CITY	7 1604900041
S COLORADO	TRADE DOLLAR	17 T010S R017E	TWIN FALLS	7 1608300076
		33 T017S R009E	TWIN FALLS	7 1608300077
		07 T005S R003W	SILVER CITY	15 1607300036

* 'S' indicates secondary name, with primary name listed to the right.

FIGURE D-1. - Page of State alphabetic index of Idaho MILS locations.

COUNTY: 079 SHOSHONE

PROPERTY NAME	PRIMARY NAME	COMMODITY	LOCATION	SEC	QUAO-OESC	SEQ
S CHARLES DICKENS	SILVER CRESCENT	LEAD	T049N R003E 25 SPOKANE			0039
S CHESTER		GOLD	T050N R005E 33 WALLACE			0113
S CHESTER	SILVER DOLLAR MINE	LEAD	T048N R003E 14 SPOKANE			0036
S CHICAGO	PARAGON MINE	LEAD	T049N R006E 07 WALLACE			0132
S CHICAGO-LONDON	PARAGON MINE	LEAD	T049N R006E 07 WALLACE			0132
S CHRISTOPHERSON		GOLD	T049N R004E 16 WALLACE			0248
S CINCINNATI MINE		LEAD	T048N R005E 23 WALLACE			0294
S CINNABAR PROSPECT	EDWARDS PROSPECT		T050N R003E 27 SPOKANE			0207
S CLARKE MINE	SUNSET MINE	LEAD	T049N R005E 33 WALLACE			0079
S CLEARWATER COPPER MINE		COPPER	T042N R007E 16 HAMILTON			0186
S CLEARWATER MINE		GOLD	T042N R010E 23 HAMILTON			0091
S COEUR D ALENE AND PINE CK ANTIMONY		COPPER	T048N R002E 06 SPOKANE			0018
S COEUR D ALENE BIG CREEK		COPPER	T048N R003E 16 SPOKANE			0076
S COEUR D ALENE MINING CO.		SILVER	T049N R006E 18 WALLACE			0137
S COEUR D ALENE NORTH FORK	MONARCH MINE	LEAD	T047N R002E 08 SPOKANE			0130
S COEUR D ALENE PREMIER		LEAD	T048N R005E 12 WALLACE			0243
S COEUR D ALENE CHAMPION MINE		LEAD	T048N R003E 24 SPOKANE			0296
S COEUR D ALENE MINE		LEAD	T048N R004E 19 WALLACE			0295
S COEUR PROJECT		SILVER	T049N R003E 35 SPOKANE			0040
S COGILL MINE		LEAD	T042N R009E 16 HAMILTON			0297
S COLUMBIA VEIN	TRIMETALLIC MNG CO CLAIMS	COPPER	T050N R005E 13 WALLACE			0182
S COLUMBUS		COPPER	T047N R002E 19 SPOKANE			0101
S COLUSA	LEUSCHEL N. P. LEASE	LEAD	T047N R002E 18 SPOKANE			0114
S COLUSA MINE		GOLD	T044N R008E 14 WALLACE			0202
S CONRAD'S CROSSING		SILVER	T048N R003E 23 WALLACE			0177
S CONSOLIDATED SILVER		LEAD	T050N R005E 13 SPOKANE			0420
S CONSOLIDATED SILVER-LEAD MINE	U.S. SILVER-LEAD MINE	LEAD	T050N R005E 13 SPOKANE			0100
S CONSOLIDATED SILVER-LEAD MINES	U.S. SILVER-LEAD MINE	LEAD	T050N R005E 13 SPOKANE			0100
S CONSTITUTION MINE		LEAD	T047N R002E 02 SPOKANE			0030
S COPPER CHIEF		COPPER	T047N R006E 21 WALLACE			0148
S COPPER KING MINE		LEAD	T048N R005E 24 WALLACE			0065
S COPPER PLATE MINE		LEAD	T048N R005E 23 WALLACE			0298
S COPPER PRINCE		COPPER	T045N R003E 10 SPOKANE			0278
S COPPER QUEEN MINE		LEAD	T047N R005E 12 WALLACE			0300
S CORBY MINE		LEAD	T048N R002E 08 SANDPOINT			0301
S COUGAR GROUP		COPPER	T045N R004E 18 SPOKANE			0165
S COUGHLIN MINE		LEAD	T048N R005E 25 WALLACE			0302
S CRANE		LEAD	T048N R003E 15 WALLACE			0303
S CRATER LAKE PEGMATITE		FELOSPAR	T043N R004E 32 WALLACE			0192
S CRESCENT		SILVER	T048N R003E 16 SPOKANE			0009
S CROWN POINT MINE		LEAD	T048N R002E 11 SPOKANE			0031
S CRYSTAL LEAD MINE		LEAD	T050N R005E 03 WALLACE			0096
S CUMMINGS MURRAY	SH-63 PIT	STONE	T048N R003E 34 SPOKANE			0422
S CUMMINGS MURRAY	TEFFI GROUP MANGANESE CLAIMS	MANGANESE	T050N R004E 28 WALLACE			0421
S CUMMINGS MURRAY	TEFFI GROUP MANGANESE CLAIM	MANGANESE	T050N R004E 28 WALLACE			0421
S CUNNINGHAM MINE		LEAD	T048N R005E 16 WALLACE			0304
S CURLEW	PAGE MINE	LEAD	T048N R002E 10 SPOKANE			0019
S CURLEW MINE	PAGE MINE	LEAD	T048N R002E 10 SPOKANE			0019

* 'S' indicates secondary name, with primary name listed to the right.

FIGURE D-2. - Page of county alphabetic index for Shoshone County MILS locations.

H 251 84





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